Listing of Claims:

1. (Currently Amended) A digital signal offset adjusting apparatus comprising:

an input terminal to which an input digital signal having a wideband frequency characteristic including a low frequency band, a direct current component, and a high frequency band is input;

a direct current voltage generator which outputs a desired direct current bias voltage;

an output terminal to output an output digital signal obtained by applying the direct current bias voltage output from the direct current voltage generator to the low frequency band, the direct current component, and the high frequency band of the input digital signal input to the input terminal;

a capacitor which is connected between the input terminal and the output terminal and which causes the output terminal to pass through the high frequency band of the input digital signal input to the input terminal;

a first coil, one end of which is connected to the input terminal, and which passes the low frequency band and the direct current component of the input digital signal to another end;

a second coil, one end of which is connected to the output terminal;

[[a]] <u>an</u> operational amplifier, a first input end of which is connected to the other end of the first coil, a second input end of which is connected to the direct current voltage generator, an output end of which is connected to another end of the second coil, and which outputs to the output terminal via the other end of the second coil from the output end, the low frequency band of the input digital signal passed to the other end of the first coil input to the first and second input ends and a composite signal obtained by combining the direct current component and the direct current bias voltage output from the direct current voltage generator; and

a frequency characteristic compensating circuit connected between a reference electrical potential point and the second input end of the operational amplifier or between the second input end and the output end, the compensating circuit being adopted to compensate for a frequency characteristic so that a gain of the operational amplifier increases with a component having a higher frequency from among the low frequency bands of the input digital signal passed to the other end of the first coil.

2. (Original) The digital signal offset adjusting apparatus according to claim 1, characterized in that, when the first and second input ends of the operational amplifier are a non-inverted

input end and an inverted input end, respectively, an input matching resistor having a predetermined value is connected between the reference electrical potential point and the non-inverted input end of the operational amplifier, a feedback resistor is connected between the output end and the inverted input end of the operational amplifier, an output matching resistor having a predetermined value is connected between the output end of the operational amplifier and the other end of the second coil, and a direct current inputting resistor having a predetermined value is connected between the inverted input end of the operational amplifier and the direct current voltage generator, whereby a subtracted and combined signal obtained by subtracting and combining by the operational amplifier the low frequency band and the direct current component of the input digital signal passed to the other end of the first coil input to the inverted input end of the operational amplifier and the direct current bias voltage from the direct current voltage generator input to the non-inverted input end of the operational amplifier is output to the output terminal via the other end of the second coil from the output end of the operational amplifier.

3. (Original) The digital signal offset adjusting apparatus according to claim 2, characterized in that the direct current inputting resistor connected between the inverted input end of

the operational amplifier and the direct current voltage generator has a value equal to a value of the feedback resistor connected between the output end of the operational amplifier and the inverted input end as the predetermined value, and the frequency characteristic compensating circuit is composed of a capacitor and a resistor connected in serial between the inverted input end and the reference electronic potential point of the operational amplifier.

4. (Original) The digital signal offset adjusting apparatus according to claim 2, characterized in that the frequency characteristic compensating circuit is composed of a serial circuit of a coil and a resistor connected between the output end and the inverted input end of the operational amplifier, and the direct current inputting resistor connected between the inverted input end of the operational amplifier and the direct current voltage generator has a value equal to a parallel combined resistance value of the feedback resistor of the operational amplifier and the resistor of the frequency characteristic compensating circuit as the predetermined value.

5. (Original) The digital signal offset adjusting apparatus according to claim 4, characterized in that the frequency characteristic compensating circuit is compatible with the

feedback resistor connected between the output end and the inverted input end of the operational amplifier by means of the resistor of the frequency characteristic compensating circuit, and is composed of a coil connected in series between the resistor compatible with the feedback resistor and the inverted input end, and a resistance value of the resistor of the frequency characteristic compensating circuit compatible with the feedback resistor of the operational amplifier is set to be equal to a resistance value of the direct current inputting resistor from the direct current voltage generator.

6. (Original) A digital signal offset adjusting apparatus comprising:

an input terminal to which an input digital signal having a wideband frequency characteristic including a low frequency band, a direct current component, and a high frequency band is input;

a direct current voltage generator which outputs a desired direct current bias voltage;

an output terminal to output an output digital signal obtained by applying the direct current bias voltage output from the direct current voltage generator to the low frequency band, the direct current component, and the high frequency band of the input digital signal input to the input terminal;

a capacitor which is connected between the input terminal and the output terminal and which causes the output terminal to pass through the high frequency band of the input digital signal input to the input terminal;

a first coil whose one end is connected to the input terminal, and which passes the low frequency band and the direct current component of the input digital signal to another end;

a second coil whose one end is connected to the output terminal;

a first operational amplifier, a first input end of which is connected to the other end of the first coil, a second input end of which is connected to a reference electrical potential point, and which outputs from an output end a first inverted and amplified signal obtained by inverting and amplifying the low frequency band and the direct current component of the input digital signal passed to the other end of the first coil;

a second operational amplifier, a first input end of which is connected to the direct current voltage generator, a second input end of which is connected to the reference electrical potential point, and which outputs from an output end a second inverted and amplified signal obtained by inverting and amplifying the direct current bias voltage output from the direct current voltage generator;

a third operational amplifier, a first input end of which is connected in common to each of the output ends of the first and second operational amplifiers, a second input end of which is connected to the reference electrical potential point, and which inverts and amplifies a combined signal obtained by combining the first and second inverted and amplified signals and outputs the inverted and amplified signal to the other end of the second coil; and

first and second frequency characteristic compensating circuits connected between the reference electrical potential point and each of the first input end of the first and third operational amplifiers or between each of the first input end and the output end of the first and third operational amplifiers, the first and second frequency characteristic compensating circuits being adopted to compensate for a frequency characteristic so that a gain of each of the first and third operational amplifiers increases with a component having a higher frequency from among the low frequency bands of the input digital signal passed to the other end of the first coil.

7. (Original) The digital signal offset adjusting apparatus according to claim 6, characterized in that, when the first and second input ends of the first to third operational amplifiers are an inverted input end and a non-inverted input end,

respectively, each of the non-inverted input ends of the first to third operational amplifiers is connected to the reference electrical potential point, an input matching resistor having a predetermined value is connected between the inverted input end and the reference electrical potential point of the first operational amplifier, first to third feedback resistors are connected, respectively, between the output end and the inverted input end of each of the first to third operational amplifiers, a direct current inputting resistor having a predetermined value is connected between the inverted input end of the second operational amplifier and the direct current voltage generator, first and second output matching resistors each having a predetermined value are connected, respectively, between the output end of each of the first and second operational amplifiers and the inverted input end of the third operational amplifier, and a third output matching resistor having the predetermined value is connected between the output end of the third operational amplifier and the other end of the second coil, whereby an added and combined signal obtained by adding and combining the first and second inverted and amplified signals output from each of the output ends of the first and second operational amplifiers is output to the output terminal via the other end of the second coil from the output end of the third

operational amplifier which inverts and amplifies the added and combined signal.

8. (Original) The digital signal offset adjusting apparatus according to claim 7, characterized in that the direct current inputting resistor connected between the inverted input end of the second operational amplifier and the direct current voltage generator has a value equal to a value of the second feedback resistor connected between the output end and the inverted input end of the second operational amplifier as the predetermined value, and the first and second frequency characteristic compensating circuits are composed of a capacitor and a resistor connected in series, respectively, between the reference electrical potential point and each of the inverted input end of the first and third operational amplifiers.

9. (Original) The digital offset adjusting apparatus according to claim 7, characterized in that the direct current inputting resistor connected between the inverted input end of the second operational amplifier and the direct current voltage generator has a value equal to a value of the second feedback resistor connected between the output end and the inverted input end of the second operational amplifier as the predetermined value, and the first and second frequency characteristic

compensating circuits are composed of a serial circuit of a coil and a resistor connected between each of the output end and the inverted input end of the first and third operational amplifiers, respectively.

10. (Original) The digital offset adjusting apparatus according to claim 9, characterized in that the first and second frequency characteristic compensating circuits are compatible with the first and third feedback resistors connected between the output end and the inverted input end of each of the first and third operational amplifiers by a resistor of each of the first and second frequency characteristic compensating circuits, respectively, and are composed of a coil connected in series between each of the resistors compatible with the first and third feedback resistors and each of the inverted input ends of the first and third operational amplifiers.

11. (Currently Amended) A pulse pattern generator comprising:

a digital signal output section which outputs a digital signal having a wideband frequency characteristic including a low frequency band, a direct current component, and a high frequency band, the digital signal being of a desired pulse pattern

including a data pattern such that identical bit data are continuous; and

a digital signal offset adjusting apparatus connected to the digital signal output section, wherein the digital signal offset adjusting apparatus comprises:

an input terminal to which a digital signal of a desired pulse pattern having a wideband frequency characteristic including the low frequency band, the direct current component, and the high frequency band output from the digital signal output section is input as an input digital signal;

a direct current voltage generator which outputs a desired direct current bias voltage;

an output terminal to output an output digital signal obtained by applying the direct current bias voltage output from the direct current voltage generator to the low frequency band, the direct current component, and the high frequency band of the input digital signal input to the input terminal;

a capacitor which is connected between the input terminal and the output terminal, and which causes the output terminal to pass through the high frequency band of the input digital signal input to the input terminal;

a first coil, one end of which is connected to the input terminal, and which passes the low frequency band and the direct current component of the input digital signal to another end; a

second coil, one end of which is connected to the output terminal;

[[a]] an operational amplifier, a first input end of which is connected to the other end of the first coil, a second input end of which is connected to the direct current voltage generator, an output end of which is connected to another end of the second coil, and which outputs to the output terminal via the other end of the second coil from the output end, the low frequency band of the input digital signal passed to the other end of the first coil input to the first and second input ends and a composite signal obtained by combining the direct current component and the direct current bias voltage output from the direct current voltage generator; and

a frequency characteristic compensating circuit connected between a reference electrical potential point and the second input end of the operational amplifier or between the second input end and the output end, the compensating circuit being adopted to compensate for a frequency characteristic so that a gain of the operational amplifier increases with a component having a higher frequency from among the low frequency bands of the input digital signal passed to the other end of the first coil.

12. (Original) The pulse pattern generator according to claim 11, characterized in that, when the first and second input ends of the operational amplifier of the digital signal offset adjusting apparatus are a non-inverted input end and an inverted input end, respectively, an input matching resistor having a predetermined value is connected between the reference electrical potential point and the non-inverted input end of the operational amplifier, a feedback resistor is connected between the output end and the inverted input end of the operational amplifier, an output matching resistor having a predetermined value is connected between the output end of the operational amplifier and the other end of the second coil, and a direct current inputting resistor having a predetermined value is connected between the inverted input end of the operational amplifier and the direct current voltage generator, whereby a subtracted and combined signal obtained by subtracting and combining by the operational amplifier the low frequency band and the direct current component of the input digital signal passed to the other end of the first coil input to the inverted input end of the operational amplifier and the direct current bias voltage from the direct current voltage generator input to the non-inverted input end of the operational amplifier is output to the output terminal via the other end of the second coil from the output end of the operational amplifier.

13. (Original) The pulse pattern generator according to claim 12, characterized in that the direct current inputting resistor connected between the inverted input end of the operational amplifier and the direct current voltage generator has a value equal to a value of the feedback resistor connected between the output end of the operational amplifier and the inverted input end as the predetermined value, and the frequency characteristic compensating circuit is composed of a capacitor and a resistor connected in serial between the inverted input end and the reference electronic potential point of the operational amplifier.

14. (Original) The pulse pattern generator according to claim 12, characterized in that the frequency characteristic compensating circuit is composed of a serial circuit of a coil and a resistor connected between the output end and the inverted input end of the operational amplifier, and the direct current inputting resistor connected between the inverted input end of the operational amplifier and the direct current voltage generator has a value equal to a parallel combined resistance value of the feedback resistor of the operational amplifier and the resistor of the frequency characteristic compensating circuit as the predetermined value.

15. (Original) The pulse pattern generator according to claim 14, characterized in that the frequency characteristic compensating circuit is compatible with the feedback resistor connected between the output end and the inverted input end of the operational amplifier by means of the resistor of the frequency characteristic compensating circuit, and is composed of a coil connected in series between the resistor compatible with the feedback resistor and the inverted input end, and a resistance value of the resistor of the frequency characteristic compensating circuit compatible with the feedback resistor of the operational amplifier is set to be equal to a resistance value of the direct current inputting resistor from the direct current voltage generator.

16. (Original) A pulse pattern generator comprising:

a digital signal output section which outputs a digital signal having a wideband frequency characteristic including a low frequency band, a direct current component, and a high frequency band, the digital signal being of a desired pulse pattern including a data pattern such that identical bit data are continuous; and

a digital signal offset adjusting apparatus connected to the digital signal output section, wherein the digital signal offset adjusting apparatus comprises:

an input terminal to which a digital signal of a desired pulse pattern having a wideband frequency characteristic including the low frequency band, the direct current component, and the high frequency band output from the digital signal output section is input as an input digital signal;

a direct current voltage generator which outputs a desired direct current bias voltage;

an output terminal to output an output digital signal obtained by applying the direct current bias voltage output from the direct current voltage generator to the low frequency band, the direct current component, and the high frequency band of the input digital signal input to the input terminal;

a capacitor which is connected between the input terminal and the output terminal, and which causes the output terminal to pass through the high frequency band of the input digital signal input to the input terminal;

a first coil, one end of which is connected to the input terminal, and which passes the low frequency band and the direct current component of the input digital signal to another end;

a second coil, one end of which is connected to the output terminal;

a first operational amplifier, a first input end of which is connected to the other end of the first coil, a second input end of which is connected to a reference electrical potential point, and which outputs from an output end a first inverted and amplified signal obtained by inverting and amplifying the low frequency band and the direct current component of the input digital signal passed to the other end of the first coil;

a second operational amplifier, a first input end of which is connected to the direct current voltage generator, a second input end of which is connected to the reference electrical potential point, and which outputs from an output end a second inverted and amplified signal obtained by inverting and amplifying the direct current bias voltage output from the direct current voltage generator;

a third operational amplifier, a first input end of which is connected in common to each of the output ends of the first and second operational amplifiers, a second input end of which is connected to the reference electrical potential point, and which inverts and amplifies a combined signal obtained by combining the first and second inverted and amplified signals and outputs the inverted and amplified signal to another end of the second coil; and

first and second frequency characteristic compensating circuits connected between the reference electrical potential

point and each of the first input end of the first and third operational amplifiers or between each of the first input end and the output end of the first and third operational amplifiers, the first and second frequency characteristic compensating circuits being adopted to compensate for a frequency characteristic so that a gain of each of the first and third operational amplifiers increases with a component having a higher frequency from among the low frequency bands of the input digital signal passed to the other end of the first coil.

17. (Original) The pulse pattern generator according to claim 16, characterized in that, when the first and second input ends of the first to third operational amplifiers of the digital signal offset adjusting apparatus are an inverted input end and a non-inverted input end, respectively, each of the non-inverted input ends of the first to third operational amplifiers is connected to the reference electrical potential point, an input matching resistor having a predetermined value is connected between the inverted input end and the reference electrical potential point of the first operational amplifier, first to third feedback resistors are connected, respectively, between the output end and the inverted input end of each of the first to third operational amplifiers, a direct current inputting resistor having a predetermined value is connected between the inverted

input end of the second operational amplifier and the direct current voltage generator, first and second output matching resistors each having a predetermined value are connected, respectively, between the output end of each of the first and second operational amplifiers and the inverted input end of the third operational amplifier, and a third output matching resistor having the predetermined value is connected between the output end of the third operational amplifier and the other end of the second coil, whereby an added and combined signal obtained by adding and combining the first and second inverted and amplified signals output from each of the output ends of the first and second operational amplifiers is output to the output terminal via the other end of the second coil from the output end of the third operational amplifier which inverts and amplifies the added and combined signal.

18. (Original) The pulse pattern generator according to claim 17, characterized in that the direct current inputting resistor connected between the inverted input end of the second operational amplifier and the direct current voltage generator has a value equal to a value of the second feedback resistor connected between the output end and the inverted input end of the second operational amplifier as the predetermined value, and the first and second frequency characteristic compensating

circuits are composed of a capacitor and a resistor connected in series, respectively, between the reference electrical potential point and each of the inverted input end of the first and second operational amplifiers.

19. (Original) The pulse pattern generator according to claim 17, characterized in that the direct current inputting resistor connected between the inverted input end of the second operational amplifier and the direct current voltage generator has a value equal to a value of the second feedback resistor connected between the output end and the inverted input end of the second operational amplifier as the predetermined value, and the first and second frequency characteristic compensating circuits are composed of a serial circuit of a coil and a resistor connected between each of the output end and the inverted input end of the first and third operational amplifiers, respectively.

20. (Original) The pulse pattern generator according to claim 19, characterized in that the first and second frequency characteristic compensating circuits are compatible with the first and third feedback resistors connected between the output end and the inverted input end of each of the first and third operational amplifiers by a resistor of each of the first and

second frequency characteristic compensating circuits, respectively, and are composed of a coil connected in series between each of the resistors compatible with the first and third feedback resistors and each of the inverted input ends of the first and third operational amplifiers.